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IS 3244 (1965): Cotton webbing, statichute [TXD 13: Textile Materials for Aerospace Purposes]



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IS : 3244 - 1965

Indian Standard
SPECIFICATION FOR
COTTON WEBBING, STATICHUTE

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Indian Standard

SPECIFICATION FOR COTTON WEBBING, STATICHUTE

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Indian Standard
SPECIFICATION FOR
COTTON WEBBING, STATICHUTE

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 18 August 1965, after the draft finalized by the Textile Materials for Aeronautical Purposes Sectional Committee had been approved by the Textile Division Council.

0.2 This standard is based on IND/AIR/TC/0337 'Webbing, cotton, statichute 1-3/4 in' issued by the Ministry of Defence, Government of India.

0.3 Webbing conforming to this standard is intended for use in para-connected items, such as for harnessing supplies to the parachutes.

0.4 This standard contains clauses which call for agreement between the buyer and the seller and which permit the buyer to use his option for selection to suit his requirements. These clauses are **3.4, 3.5.1, 4.1 and 6.1**.

0.5 All quantities and dimensions in this standard have been given in the metric system. Non-metric values to which the industry has been accustomed have also been given in brackets, wherever necessary.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes constructional details and other particulars of cotton webbing, statichute, scoured, used in supply-dropping parachutes.

1.2 This standard does not specify the general appearance, feel, etc of the webbing (*see also 3.5*).

*Rules for rounding off numerical values (*revised*).

AMENDMENT NO. 1 JULY 1987

TO

IS:3244-1965 SPECIFICATION FOR COTTON WEBBING,
STATICHUTE

(Page 3, clause 3.3.1) Substitute the following for the existing clause:

'3.3.1 The scouring loss of the webbing shall be determined by the mild method as prescribed in IS:1383-1977*'.
'

(Page 3, foot-note with '*' mark) - Substitute the following for the existing foot-note:

'*Methods for determination of scouring loss in grey and finished cotton textile materials (first revision).'
'

(TDC 27)

Reprography Unit, BIS, New Delhi, India

2. GENERAL REQUIREMENTS

2.1 Yarn — Yarn made from good quality cotton shall be used in the manufacture of the webbing. It shall be reasonably clean and free from neps, snarls, slubs and other defects and shall be of a quality required to ensure that the webbing complies with the requirements of this standard. The single and plied yarns shall be evenly spun and uniformly twisted. The approximate count of warp and weft yarn is given in Table 1.

2.2 Webbing

2.2.1 The webbing shall be of herringbone weave.

2.2.2 It shall be uniformly woven with firm selvedges, and shall be reasonably free from defects.

2.2.3 It shall be free from sizing or finishing materials.

3. SPECIFIC REQUIREMENTS

3.1 Construction — The webbing shall comply with the requirements of Table 1. The permissible tolerances and the methods of tests for the various requirements have also been prescribed in the table.

3.2 Water Solubles — The amount of water soluble matter present in the webbing shall not exceed 1 percent.

3.2.1 The amount of water soluble matter present in the webbing shall be determined by the method prescribed in Appendix C.

3.3 Scouring Loss — The scouring loss of the webbing shall not exceed 2 percent.

3.3.1 The scouring loss of the webbing shall be determined by the method prescribed in IS : 1383-1960*.

3.4 Length — The length of each roll of webbing shall be as may have been specified in an agreement between the buyer and the seller.

3.4.1 The length of webbing of each roll constituting the sample under test shall be determined by the method prescribed in Appendix D.

3.5 Sealed Sample — If, in order to illustrate or specify the general appearance, feel, etc, of webbing, a sample has been agreed upon and sealed, the supply shall be in conformity with the sample in such respects.

3.5.1 The custody of the sealed sample shall be a matter of prior agreement between the buyer and the seller.

*Method for determination of scouring loss in grey and finished cotton textile materials.

TABLE 1 PARTICULARS OF COTTON WEBBING, STATICHUTE

(Clauses 2.1 and 3.1)

*UNIVERSAL COUNT (OR COTTON COUNT) OF YARN (APPROX)	ENDS IN FULL WIDTH		PICKS PER dm (or in)	WIDTH IN mm	WEIGHT IN kg PER 100 m Max	THICKNESS in mm	BREAKING LOAD IN kg ON FULL WIDTH X 50 cm TEST LENGTH	
	Warp	Weft					Min	Max
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
84 tex X 5 (or 7s/5)	84 tex X 3 (or 7s/3)	130	52 (or 13)	45	8.25	2.5	910	

TOLERANCE

+ 5 - 2.5 percent	+ 5 - 2.5 percent	+ 0 - 1	-	± 0.25	-
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METHODS OF
TESTS

7.1 of IS : 1963- 1961†	7.2 of IS : 1963- 1961†	Appendix A	Appendix B	8.2 to 8.5 of IS : 1954- 1961‡	9.1 to 9.4 of IS : 1969-1961§
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NOTE 1 — For determining the number of picks per inch, multiply the values for picks per decimetre obtained on test by 0.254.

NOTE 2 — Alternate constructions of the webbing with corresponding alteration in counts, ends and picks are permissible provided the other characteristics, namely, width, weight, thickness and breaking load of the webbing remain the same as specified in this table.

* Universal count, in tex = the number of grams per kilometre.

† Method for determination of ends and picks per unit length in woven fabrics.

‡ Method for determination of dimensions of fabrics.

§ Method for determination of breaking load elongation at break of woven fabric (by-constant-rate-of-traverse machine).

4. PACKAGING

4.1 Webbing shall be made into rolls of 50 m or in any other length as agreed to between the buyer and the seller.

5. MARKING

5.1 Each roll shall be legibly marked with the following information:

- a) Name of the material;
- b) Width of the webbing;
- c) Length of the roll;
- d) Name of the manufacturer, initials or trade-mark; and
- e) Month and year of manufacture.

5.1.1 Each roll may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6. PACKING

6.1 Rolls shall be individually wrapped in kraft paper and a number of such rolls shall be packed in wooden packing cases. The wooden packing cases shall be lined with one layer of polyethylene film of at least 40 microns thickness conforming to the requirements of Grade 123 of IS : 2508-1963* or one layer of waterproof paper conforming to Type 1 of IS : 1398-1960†. The number of rolls to be packed in a case shall be as may have been agreed to between the buyer and the seller.

7. SAMPLING

7.1 Lot — The quantity of webbing delivered to one buyer against one despatch note shall constitute a lot.

7.2 The conformity of the lot to the requirements of this standard shall be determined on the basis of tests carried out on the samples selected from the lot.

*Specification for low density polyethylene film.

†Specification for packing paper, waterproof, bitumen laminated.

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7.3 Unless otherwise agreed to between the buyer and the seller, the number of rolls to be selected at random from a lot shall be in accordance with col 2 of Table 2.

TABLE 2 SAMPLE SIZE AND CRITERIA FOR CONFORMITY

(Clauses 7.3, 7.4, 7.5 and 7.6)

LOT SIZE (ROLLS)	SAMPLE SIZE (NUMBER OF ROLLS TO BE SELECTED)	PERMISSIBLE NUMBER OF DEFECTIVE ROLLS	SUB-SAMPLE SIZE (NUMBER OF ROLLS TO BE SELECTED)
(1)	(2)	(3)	(4)
Up to 100	10	1	5
101 „ 300	15	1	6
301 „ 500	25	2	7
501 „ 800	35	3	8
801 „ 1 300	50	4	9
1 301 and above	75	6	10

7.4 For evaluating (a) ends in full widths and picks per decimetre (or inch), (b) width, (c) thickness, and (d) length, the rolls selected as in col 2 of Table 2 shall constitute the test sample.

7.5 For evaluating (a) breaking load, (b) weight, (c) water solubles, and (d) scouring loss, the number of rolls specified in col 4 of Table 2 shall constitute the test sample. These rolls shall be selected at random from those selected in col 2 of Table 2. The required number of test specimens shall be drawn from each roll and subjected to corresponding tests.

NOTE — In the case of breaking load tests, at least 10 test specimens shall be drawn from each roll for the purpose of tests.

7.6 Criteria for Conformity — The lot shall be considered to be in conformity with the requirements of this standard, if the following conditions are satisfied:

- a) The number of rolls found defective with respect to any characteristic except length mentioned in 7.4 does not exceed the corresponding number given in col 3 of Table 2.

NOTE — In the case of length, the value obtained for each roll shall be compared with its specified, declared or marked length. The mean percentage of deficiency in length, if any, shall be determined and made applicable to the lot.

- b) From the observed values of breaking load tests in respect of each roll in the test sample, the average breaking load value is calculated. From all such average values, the grand average \bar{X} and the range

R_1 is calculated and the value of the expression $\bar{\bar{X}} - 0.4 R_1$ is found to be greater than or equal to the specified value.

NOTE 1 — The average breaking load value for a roll is the value obtained by dividing the sum of the observed values in respect of the test specimens taken from the roll, by the number of test specimens. The grand average $\bar{\bar{X}}$ is the value obtained by dividing the sum of the average breaking load values in respect of rolls in the test sample, by the number of rolls tested.

NOTE 2 — The range R_1 is the difference between the maximum and the minimum in a set of average breaking load values for the rolls tested.

- c) From the observed values of weight, the average \bar{X} and the range R are calculated and the value of the expression $\bar{X} + 0.4 R$ is found to be less than or equal to the specified value.
- d) From the observed values of water solubles, the average \bar{X} and the range R are calculated and the value of the expression $\bar{X} + 0.4 R$ is found to be less than or equal to the specified value.
- e) From the observed values of scouring loss, the average \bar{X} and the range R are calculated and the value of the expression $\bar{X} + 0.4 R$ is found to be less than or equal to the specified value.

NOTE 1 — Average \bar{X} is the value obtained by dividing the sum of the observed values by the number of tests.

NOTE 2 — Range R is the difference between the maximum and the minimum in a set of observed values.

APPENDIX A

(Table 1)

METHOD FOR DETERMINATION OF WIDTH OF THE WEBBING

A-1. TEST SPECIMENS

A-1.1 For the purpose of this test, all the rolls in the test sample (*see 7.4*) shall constitute the test specimens.

A-2. PROCEDURE

A-2.1 Unroll one test specimen and lay a portion of it on a horizontal surface and smooth it out with no greater tension than is necessary to make it lie straight and flat.

A-2.2 Measure to an accuracy of 1 mm, the width of the webbing by means of a graduated steel scale placed at right-angles to the selvages.

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A-2.3 Determine similarly the width of the webbing at 5 different places uniformly distributed along the length of the roll. Calculate the mean of the 5 test values.

A-2.4 Repeat the test with the remaining test specimens.

A-3. REPORT

A-3.1 Report the lot to be in conformity with the relevant requirement of Table 1, if the number of rolls whose width varies from the relevant value specified in Table 1 by more than the tolerance prescribed in the table, is not more than the corresponding number given in col 3 of Table 2.

A P P E N D I X B

(Table 1)

**METHOD FOR DETERMINATION OF WEIGHT PER
100 METRES**

B-1. TEST SPECIMENS

B-1.1 Cut a piece of webbing approximately 4 m in length from each of the rolls constituting the sample under test (*see 7.5*).

B-2. CONDITIONING OF TEST SPECIMENS

B-2.1 Prior to test, the test specimens shall be conditioned in a standard atmosphere at 65 ± 2 percent relative humidity and $27^\circ \pm 2^\circ\text{C}$ temperature (*see IS : 196-1950**) for 48 hours.

B-3. PROCEDURE

B-3.1 Take a test specimen and apply a tension equal to one percent of the minimum breaking load of the webbing (*see Note*). After 60 ± 5 seconds, place two marks on the webbing at a distance of 3 m apart.

NOTE — The tension may be applied in a breaking load testing machine; it may also be applied by fixing one end of the webbing to a peg and passing the webbing around a pulley and hanging the desired load at the other end.

B-3.2 Release the load and cut the test specimen at the marks, and determine its weight to the nearest gram.

*Atmospheric conditions for testing.

B-3.3 Calculate the weight of the webbing per 100 m by the following formula:

$$W = \frac{W_1}{3} \times 100$$

where

W = weight of 100 m of the webbing, and

W_1 = weight of 3 m length of the webbing (*see B-3.2*).

B-3.4 Repeat the test with the remaining test specimens (*see B-1.1*).

B-4. REPORT

B-4.1 Report the lot to be in conformity with the relevant requirement of Table 1, if the condition prescribed in 7.6 (c) is satisfied.

A P P E N D I X C

(*Clause 3.2.1*)

METHOD FOR DETERMINATION OF WATER SOLUBLES

C-1. TEST SPECIMENS

C-1.1 Cut one test specimen weighing approximately 10 g from each roll constituting the sample under test (*see 7.5*).

C-2. CONDITIONING OF TEST SPECIMENS

C-2.1 Prior to test, the test specimens shall be conditioned in standard atmosphere at 65 ± 2 percent relative humidity and $27^\circ \pm 2^\circ\text{C}$ temperature (*see IS : 196-1950**) for 48 hours.

C-3. PROCEDURE

C-3.1 Weigh one test specimen, conditioned as prescribed in C-2, correct to the nearest 0.001 g. Cut the test specimen into small pieces, and boil the pieces in 200 ml of distilled water in a beaker for half an hour and filter into a 500-ml measuring flask. Extract the test specimen twice again, using 100 ml of distilled water each time and boiling for 15 minutes, and filter the aqueous extracts into the same flask. Pour the solution into a beaker and concentrate it to a small volume. Then transfer it to a basin of known weight, washing the beaker with a little distilled water. Evaporate the contents of the basin on a steam-bath and dry to constant

*Atmospheric conditions for testing.

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weight in an air-oven maintained at 105° to 110°C. Determine the weight of the residue.

C-3.2 Calculate the percentage of water solubles by the following formula:

$$\text{Water solubles, percent} = \frac{W_1 \times 100}{W_2}$$

where

W_1 = weight of the residue, and

W_2 = weight of the test specimen.

C-3.3 Repeat the test with the remaining test specimens.

C-4. REPORT

C-4.1 Report the lot to be in conformity with the requirements of 3.2, if the test values satisfy the conditions prescribed in 7.6 (d).

A P P E N D I X D

(*Clause 3.4.1*)

METHOD FOR DETERMINATION OF LENGTH OF ROLL

D-1. TEST SPECIMENS

D-1.1 For the purpose of this test, all the rolls in the test sample (*see 7.4*) shall constitute the test specimens.

D-2. EQUIPMENT

D-2.1 A flat table little over 5 m long having a smooth horizontal surface with markings in metres and centimetres on one side shall be used.

D-3. PROCEDURE

D-3.1 Unroll one test specimen and draw one of its ends across the full length of the table and smoothen the portion of the webbing on the table with no greater tension than is necessary to make it lie straight and flat.

D-3.2 Mark on the webbing the first 5 m length as measured against the mark on the table. Measure the entire length in 5 m lengths till a length less than 5 m remains. Measure this length correct to a centimetre in metres and centimetres against the markings on the table.

D-3.3 Compare the value obtained as in **D-3.2** with the declared or marked length of the roll and note the deficiency in length, if any.

D-3.4 Repeat the test with the remaining test specimens and calculate the mean percentage deficiency in length, if any.

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